

### **IN THE DRAWINGS**

Please substitute the enclosed two replacement sheets for the original drawing sheets, containing figs. 1-7

## **REMARKS**

Reconsideration and removal of the grounds for rejection are respectfully requested. Claims 1-8 were in the application, claims 9-10 have been withdrawn, claims 1, 2, 3 and 5-8 have been amended, and claims 11 and 12 have been added.

The Examiner objected to the drawings as failing to show the first nozzle and the second nozzle. These were shown in the drawings as central hole 17, first nozzle, and the gap 14, second nozzle, and the specification has been amended to clarify the relationship. Figs 1 and 4 have also been amended to clarify the lead lines, to avoid the arrow heads obscuring the illustrated embodiments. Support for these changes is found in claim 1 which defined the first nozzle, and the specification, page 5, lines 3-5 which define the second nozzle, so no new matter is involved in these amendments.

Fig. 2 has been corrected to show the separate drawings as figs. 2a, 2b and 2c, with the specification correspondingly amended.

Two typographical corrections were also made by amendments to the specification.

Fig. 6 has been revised to better conform to the description in the specification. On page 11, line 9-16, it is explained that the cone engagement point is spaced from the shoulder face 31 at a length greater than the length of the compression spring, which is of course necessary for the unit to move down and seal the unit during operation. Original Fig. 6 did not appear to have sufficient room for this to occur, and so has been amended to conform to the specification and to better illustrate this feature of the invention.

The Examiner objected that the drawings failed to show the mandrel face 13 and the central shaft. The mandrel face 13 is illustrated in fig. 1, and the term "central shaft", which is believed to have been a poor translation of "center line", was removed from claim 1, rendering moot this objection.

The rejection of claims 1-8 under 35 USC 112, first paragraph is believed to have been rendered moot by the amendments to these claims, and with the corrections to the specification which now contains clear references to the first nozzle and second nozzle, as discussed above. The term "central shaft" has been deleted, and the term "one nozzle" appears to have been another translation error, as it is clear that the term "first nozzle" was intended.

The rejection of claims 1-8 as being indefinite is believed to be moot as each claim has been reviewed and amended for clarity, to remove indefinite terminology and grammar, and to provide proper antecedent basis for the various elements. However should the Examiner believe additional corrections are necessary, it is requested that the Examiner call the undersigned to effect these by Examiners' Amendment.

Claims 2, 3, 5, 7 and 8 have been amended to correct various errors, such as the face (13) of claims 2 and 3 should have been the baffle face (18) as discussed in the specification, on pages 9 and 10. The alternative language of claim 7 has been separated out and presented as new claim 11. Similarly, the secondary limitations of claim 8 have been separated out and presented as new claim 12.

Claims 1 and 7 were rejected as being anticipated under 35 USC 102(b) by Haisley, GB 2,299,281.

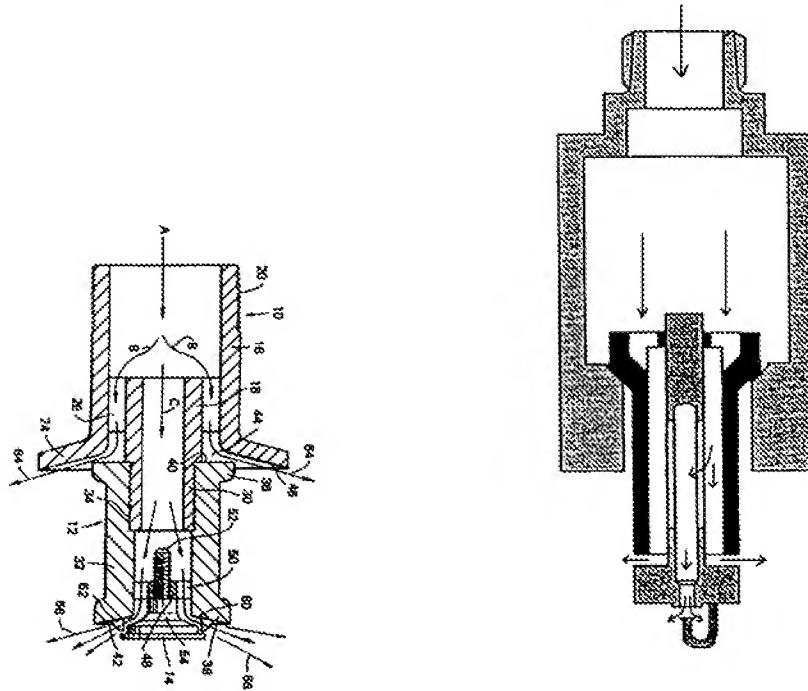
To have anticipation, each and every element of the claim must be found in a single prior art reference W.L. Gore & Assoc. V. Garlock, Inc. 721 F.2d. 1540 (Fed. Cir. 1983). “Lack of novelty (often called ‘anticipation’) requires that the same invention, including each element and limitation of the claims, was known or used by others before it was invented by the patentee” Hoover Group, Inc. v. Custom Metalcraft, Inc., 66 F.3d 299, 302, 36 U.S.P.Q.2D (BNA) 1101, 1103 (Fed. Cir. 1995) (emphasis added)

Anticipation requires the reference to describe all the elements of the claims, arranged as in the patented device. Shearing v. Iolab Corp., 975 F.2d 1541, 1544-45, 24 U.S.P.Q.2D (BNA) 1133, 1136 (Fed. Cir. 1992); Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 U.S.P.Q.2D (BNA) 1913, 1920 (Fed. Cir. 1989); Perkin-Elmer Corp. v. Computervision Corp., 732 F.2d 888, 894, 221 U.S.P.Q. (BNA) 669, 673 (Fed. Cir. 1984); C.R. Bard, Inc. v. M3 Sys., Inc., 157 F.3d 1340, 1349 (Fed. Cir., 1998).

Anticipation requires strict identity, without guessing what the reference discloses. Dayco Products, Inc. V. Total Containment Inc., 329 F.3d 1358 (Fed. Cir. 2003). A claim cannot be “anticipated” by prior art that does not have all of the limitations in the claim. Helifix Ltd. v. Blok-Lok, Ltd., 208 F.3d 1339, 1346 (Fed. Cir. 2000); SmithKline Beecham Corp. v. Apotex Corp., 439 F.3d 1312, 1324 (Fed. Cir. 2006).

Claims 1 and 7 are not anticipated by Haisley. To begin, it is believed useful to review the operation of the applicants' invention. For reference, a version of Fig. 4, showing the liquid atomizer unit when in operation is depicted here.

In operation, the unit moves down into sealing engagement with the nozzle housing so that liquid entering the housing is directed through the holes or gaps located on the bottom 2 of the cup. All of the liquid then passes into the cavity of the cup where it is split, some passing to the gap 14 for discharge in a full 360 degree circle, another portion passing through the side holes or slots in the mandrel, into the center hole 10 for discharge from the central hole 17. Note that the hole 17 is unobstructed so a full cone of liquid is developed. After exiting the hole 17, the liquid is disbursed by a baffle 18 located in front of the hole 17.



Note that the mandrel is attached at the bottom 2 to the cup and there are no obstructions or attachments to the cup in the cavity.

Comparing this to Haisley, there are several important differences. First, there is a diffuser 14 threaded into the opening 60 so the opening is "partially

blocked" (abstract), as opposed to the full opening of applicants' central hole 17. The elements 50 also break the flow by the opening, so that a full 360 degree spread is not assured. No such elements are found in the applicants' device, because the mandrel attaches at the bottom 2. Further, there are no side slots or holes shown leading to the opening. As to the annular opening 44, the flow is similarly divided because of the elements 26 being located near the exit. Note that there is no perforated element at the entry corresponding to the bottom 2 of the applicants' invention.

Moreover, these differences are important, leading to significant advantages. The mounting of the mandrel to the bottom allows full 360 degree liquid flow at the liquid exit 14, yielding better atomization and even distribution. The placement of a baffle face 18 in front of the hole 17 also provides more uniform distribution directly under the unit, as opposed to the Haisley unit where radial distribution is predominant.

Consequently, all the elements are not present in the reference, and those that are present are not arranged as they are in the applicants' claimed invention, and so claims 1 and 7 are not anticipated thereby.

Claims 2-5 were rejected as being obvious over Haisley.

To establish a prima facie case of obviousness, there should be some teaching, suggestion or motivation in the prior art to make the specific combination that was made by the applicant. In re Raynes, 7 F.3d 1037, 1039, 28 U.S.P.Q.2D (BNA) 1630, 1631 (Fed. Cir. 1993); In re Oetiker, 977 F.2d 1443, 1445, 24 U.S.P.Q.2D (BNA) 1443, 1445 (Fed. Cir. 1992). However, the Supreme Court has determined that the search for a teaching or suggestion

should not be rigid, and a more flexible approach to a determination of obviousness should be used so as to avoid a conflict with common sense. KSR International Co. v. Teleflex Inc. et al, 2007 U.S. Lexis 4745 U.S. Supreme Court, April 30, 2007. In their decision, however, the Supreme Court reaffirmed that obviousness can not be established by a hindsight reconstruction to produce the claimed invention. In re Gorman, 933 F.2d 982, 986, 18 U.S.P.Q.2D (BNA) 1885, 1888 (Fed. Cir. 1991). It is the prior art itself, and not the applicant's achievement, that must establish obviousness.

Here, there is nothing in Haisley to lead one to the applicants' invention. To the contrary, Haisley teaches the superiority of using a diffuser which partially blocks the opening, while the applicant takes the opposite approach, leaving a full, unblocked opening and only engaging the liquid after it has left the opening 17. Further, as to claim 2, there is no teaching for providing a leg supporting a baffle face in front of the opening. As to claims 3 and 5, there are no corresponding elements in Haisley, and clearly there is no teaching of the parameters claimed, such as the space between the opening and the baffle face. No such space is possible in Haisley. Claim 4 relates to the holes or slots in the side of the mandrel. No such holes or slots are shown, taught or suggested in Haisley.

Based on the above amendments and remarks, favorable consideration and allowance of the application are respectfully requested. However should the examiner believe that direct contact with the applicant's attorney would advance the prosecution of the application, the examiner is invited to telephone the undersigned at the number given below.

Respectfully submitted,

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## **MARKED UP COPIES OF SPECIFICATION PARAGRAPHS**

On page 5, line 26, replace the heading "Drawing" with the following new heading:

### **Drawing Brief Description of the Drawings**

The paragraph extending from page 5, line 28 to page 6, line 20 is amended as follows:

An exemplary embodiment of a liquid atomizer unit for fire extinction according to the invention will be described more fully below with reference to the drawing, in which:

fig. 1 shows a liquid atomizer unit for fire extinction according to the invention,

~~fig. 2 shows~~ figs. 2a, 2b and 2c show holes and slots in the bottom of the liquid atomizer unit shown in fig. 1,

fig. 3 shows alternative holes in the side wall of the liquid atomizer unit shown in fig. 1,

fig. 4 shows the liquid atomizer unit shown in fig. 1, arranged in a nozzle housing,

fig. 5 shows the liquid atomizer unit shown in fig. 1 as part of a heat-released liquid nozzle for filled pipe systems,

fig. 6 shows the liquid atomizer unit shown in fig. 1 as part of an open liquid mist nozzle for dry pipe systems, and

fig. 7 shows the liquid atomizer unit shown in fig. 1 with an integrated liquid connection gate.

The paragraph extending from page 6, line 27 to page 7, line 4 is amended as follows:

The novelty of the invention is that it consists of a cup 1 with a bottom 2 (see fig. 1), where the bottom 2 may be penetrated by holes 3 (see fig. 2a) or one or more grooves 4, 5 (see fig. 2b, 2c ), and an outer face containing a convex conical face 6 with an angle of between 20° and 130°, and the ratio of the longitudinally sectional area to the cross-sectional area of the cavity of the cup is 0.10 - 0.20. Instead of being arranged in the bottom 2 of the cup, holes or slots 8 may be arranged on the side face of the cup over the conical member 9 (see fig. 3). The holes or the slots 8 have an area of between 0.50 and 0.90 relative to the hole cross-sectional area of the cup.

The paragraph extending from page 7, line 13 to line 18 is amended as follows:

Outside the periphery 12 of the cup the mandrel 7 expands and forms a face 13 whose cross-sectional area is larger than the cross-sectional area of the cup hole and a diameter which is 70% to 130% of the diameter of the outer periphery of the cup. The face 13 forms a gap 14 between the peripheral face 12 of the cup and the mandrel face 13 which is between 0.1 mm and 2 mm wide, the gap 14 forming a second nozzle for discharge of liquid therefrom.

The paragraph extending from page 7, line 20 to line 26 is amended as follows:

The peripheral edge 15 of the mandrel may be 45° to 90°, depending on the requirement with respect to the distribution of the extinguisher. The end 16 of the mandrel is formed with an elevation 21 having a central hole 17 which forms a first nozzle for discharge of liquid, with a diameter of 0.1 to 0.7 relative to the centre hole 10 of the mandrel which connects the centre hole 10 of the

mandrel to the atmosphere. The distance between the periphery of the elevation 21 and the periphery of the bore 17 does not exceed 5 mm. The elevation is at least 1 mm high.

The paragraph extending from page 8, line 7 to line 28 is amended as follows:

When the invention is arranged in the cavity in a nozzle housing 23 (see fig. 4) with a water connection gate 24 and a concave conical face 25 having a smallest diameter smaller than the largest diameter over the conical face 6 of the invention and a conical angle larger than or equal to the conical angle of the invention, the cone of the nozzle housing will prevent the cup 1 from dropping out of the nozzle housing 23, and it ~~will~~ will centre the cup 1 in the centre line of the nozzle housing, and the two cones will seal against each other, if water pressure is applied to the water connection gate 24 of the nozzle housing and presses through it on the bottom face 2 of the cup. Liquid will flow through the connection gate 24 of the nozzle housing, if it is not sealed, and the liquid pressure will press the two conical faces 6, 25 together, thereby providing a seal against leakage between the two conical faces 6, 25. Hereby, most of the cup 1 with the nozzle gap 14 and the nozzle bore 17 is completely free of the nozzle housing 23. Liquid will flow through the holes or the gaps 3, 8 in the cup 1 and into the cavity of the cup. Because of a limited gap width 14 between the mandrel face 13 and the peripheral face 12 of the cup, a relatively high liquid pressure is provided in the cavity. This causes liquid to flow into the centre hole 10 of the mandrel via the holes 11 in the mandrel 7. Liquid flows through the mandrel 7 and out of the smaller hole 17 in the mouth of the mandrel. The size of the hole 17 is adjusted such that the liquid pressure in the cavity of the cup remains relatively high.

The paragraph extending from page 10, line 1 to line 10 is amended as follows:

The air turbulences that occur around the liquid atomizer nozzle when liquid is distributed from the gap 14 (second nozzle) and the bore 17 (first nozzle) mean that the liquid distribution from the gap 14 ~~smoothen~~ smooths the liquid distribution from the bore ~~45~~ 17 and automatically compensates for missing liquid coverage in shadow areas such that the liquid atomizer unit distributes a homogeneous distribution of liquid droplets over a very large coverage area, with slightly larger water drops in the outermost periphery. This is an advantage, because it causes the walls to be wetted slightly more than for traditional water mist systems, which reduces the risk of fire spreading along the walls, without this causing major damage.